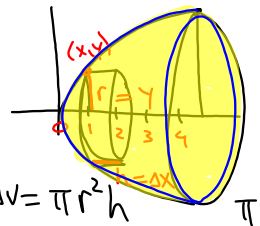
24. $y = \sqrt{x}$ $[0,5]$



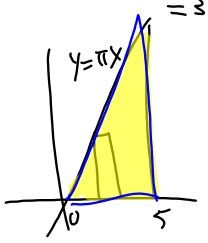
$x_0 = 0$ $y_0 = 0$
$x_1 = 1$ $y_1 = \sqrt{1}$
$x_2 = 2$ $y_2 = \sqrt{2}$
$x_3 = 3$ $y_3 = \sqrt{3}$
$x_4 = 4$ $y_4 = \sqrt{4}$

$\Delta V = \pi r^2 h$
$= \pi x \cdot \Delta x$

$\pi[0+1+2+3+4] \cdot 1 = 10\pi$
$= 31.4$

$V \approx \sum \pi x \Delta x$

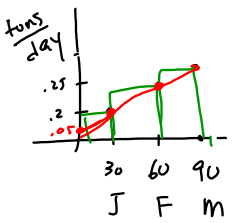
Define $f(x) = \pi x$
LRAM $(0, 5, 5)$



$A = \frac{1}{2} \cdot 5 \cdot 5\pi$
$= \frac{25}{2}\pi$ exact

Nov 7-9:44 AM

29.



upper: $30[.2 + .25 + .27 \ldots + .52]$
60.9

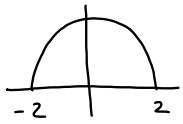
lower $30[.05 + .21 + .25 \bullet \cdot .45]$
46.8

tons/day · day = tons

Nov 7-10:16 AM

5.2 Definite Integrals

Estimate the area under the graph $f(x) = \sqrt{4 - x^2}$
using various rectangular methods with n = 10,50,100,500



$A = \frac{\pi \cdot 2^2}{2} = 2\pi$

What happens as n approaches infinity?

LRAM
MRAM
RRAM
$\longrightarrow$ 6.28319 (2π)

Nov 10-5:07 PM

definition of a definite integral as a limit of a Riemann Sum

$$\lim_{n\to\infty} \sum_{i=1}^{n} \sqrt{4 - x_i^2}\,\Delta x = \int_{-2}^{2} \sqrt{4 - x^2}\,dx$$

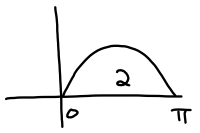
height · width

exact exact

$$\lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\Delta x = \int_a^b f(x)\,dx$$

Nov 10-6:04 PM

Find the area under one arch of a sine curve



$\int_0^{\pi} \sin(x)\,dx = 2$

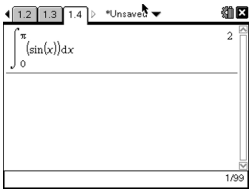
net area

$\int_0^{2\pi} \sin(x)\,dx = 0$

$\int_{\pi}^{2\pi} \sin(x)\,dx = -2$

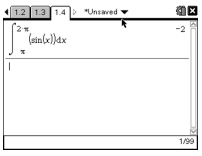
Nov 7-10:52 AM

Definite Integrals on Nspire CAS



Nov 10-6:06 PM

Definite Integrals and signed area



Nov 10-6:09 PM

Find the area $y = x^2 - 1$ $[0, 2]$

answer is not $\frac{2}{3}$

$\int_0^2 x^2 - 1\,dx = \frac{2}{3}$

Nov 7-10:59 AM